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Three New and Little-known Harvestmen (Arachnida, Opiliones, Phalangiidae) from Korea

With 4 Text-figures

Seisho SUZUKI

Nishihakushima-cho 17-2, Naka-ku, Hiroshima-shi, Hiroshima 730, Japan

ABSTRACT Two new material, *Nelima genufusca tuberculata, N. coreana,* and the male of *Oligolophus tienmushanensis* WANG (Opiliones, Phalangiidae), all from Korea, are described and illustrated.

The harvestmen of the genus *Nelima* are a difficult group because of the lack of external morphological characters distinguishing species. Thus, many species remain indistinct particularly in eastern Asia. In this paper, two new material of Korea will be described. *Oligolophus tienmushanensis* WANG was known only on the female. The description and illustrations of the male from Korea will be given for the first time. The holotypes and specimens used are at present in my collection.

Nelima genufusca tuberculata n. subsp.

(Figs. 1 and 2A)

Material. Holotype ♂: Korea: Jeju-do, Anduk Gorge, 8.X.1974 (H. HATTA). Paratype: Korea: Jeju-do, Sukipo, 1♀, 30.VIII.1937 (K. Y. PAIK).

Measurements (in mm). ♂ (in parentheses ♀): Total body length 6.0 (6.9), cephalothorax 4.1 (4.0) W, abdomen 3.6 (4.1) W. Femur I 14.1 (8.4), total length of leg I 69.2.

Male. Body. Of the form as in Fig. 1A. Surface of dorsum uniformly and finely shagreened. A few small tubercles present anteriorly on the median region of carapace. Eye tubercle, in profile longer than high, shallowly canaliculate above, 5–6 small pointed teeth on the carinae. Coxae and genital plate clothed thickly with coarse granulations, no marginal row of tubercles; free sternites with a transverse row of granules; granules more numerous anteriorly. Labrum: distal portion only slightly thickened, bluntly pointed (Fig. 1 E–F).

Chelicerae. Of normal structure; segment I unarmed above, II only hairy.

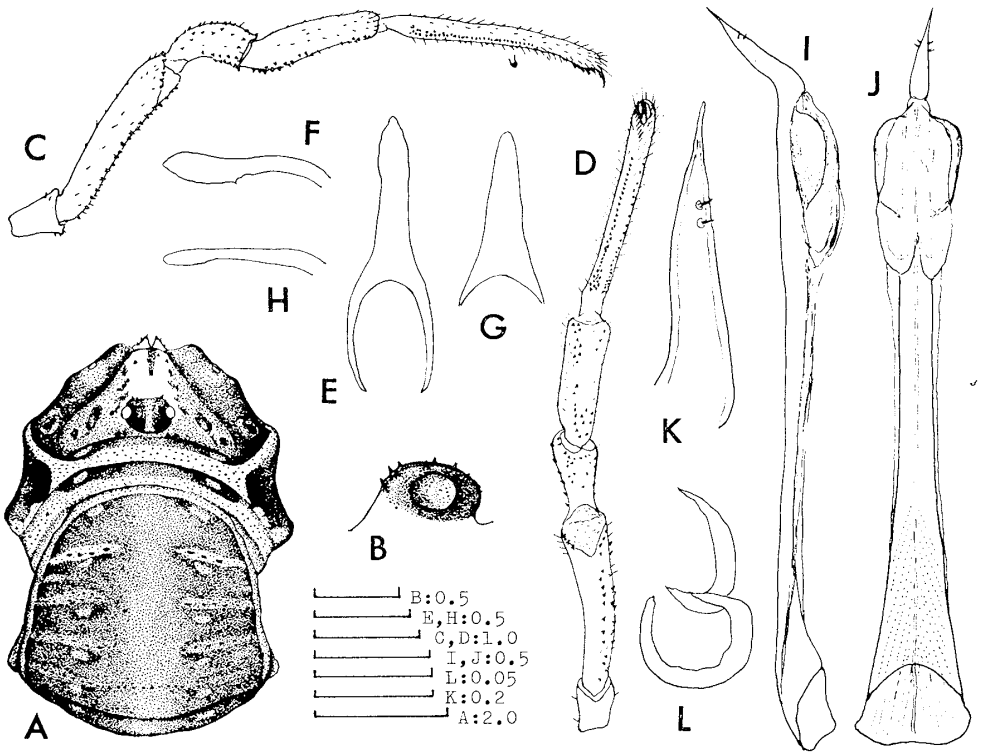

Fig. 1. *Nelima genufusca tuberculata* n. subsp. —— A. Body, ♂, dorsal view; B, left side view of eye tubercle, ♂; C, mesal and D, ventral view of left palp, ♂; E, G, dorsal, and F, H, lateral view of labrum: E–F, ♂, G–H, ♀; I, lateral, and J, ventral view of entire penis; K, lateral view of glans; L, seminal receptacle. Scale in mm.

Supracheliceral lamellae armed with a few small teeth.

Palpi. Of moderate size; patella without a mediodistal apophysis. Differing from the nominate form, all segments thickly armed with tubercles. Femur ventrally with numerous tubercles, dorsally at distal margin with some ones; patella dorsally and ventrally, tibia ventrally tuberculated; tarsus with two ventral rows of small tubercles as shown in Fig. 1 C–D.

Legs. Very slender and long. Trochanters laterally and femora throughout toothed; patellae and tibiae with fine teeth, metatarsi toothed only proximally.

Coloration. Dorsum rusty to dark brown with blackish markings on each side of cephalothorax, markings as shown in Fig. 1A. Median region in front of eye tubercle silvery-white and two short dark brown lines run from the anterior margin. Eye tubercle rusty brown, black around eyes, lighter basally. Abdominal scutum and free tergites almost blackish and one pair of small rusty yellow spots present on each segment; borders between scutal segments marked with rusty yellow on both sides, that between first and second areas particularly marked. All coxae and genital plate rusty brown, darker distally and I–III with a large median patch of whitish yellow, IV with a similar spot at prolateral surface; free sternites whitish

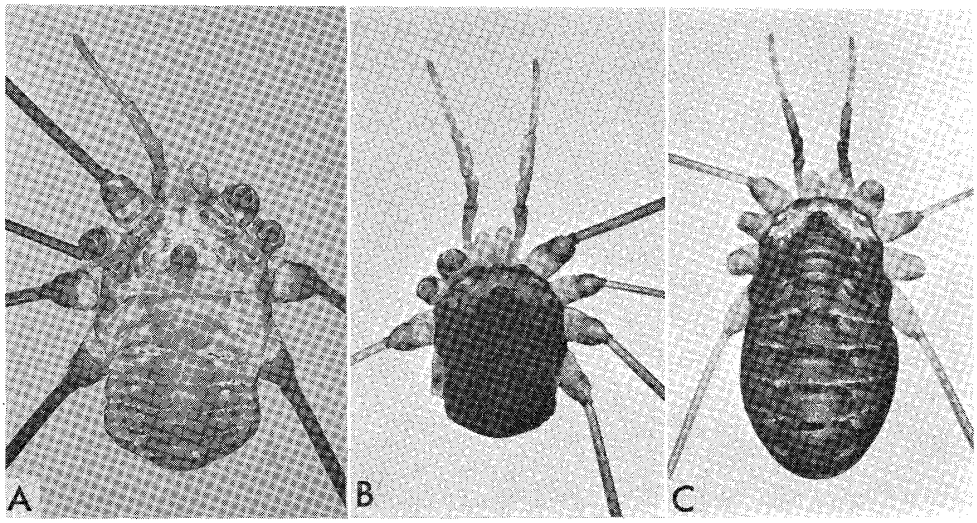

Fig. 2. Dorsal view of body. —— A, *Nelima genufusca tuberculata* n. subsp., ♀, ×8; B–C, *Nelima coreana* n. sp.: B, ♂ (Suyeo Cave ex.), ×9, C, ♀ (Mt. Chilhyon ex.) ×9.

yellow, median areas smudged with brown. Chelicerae except for blackish fingers rusty yellow, and so palpi, but femur, patella and tibia darker distally. Trochanters of legs rusty brown, blackish laterally, with small pale patches above; remaining leg-segments rusty to dark brown, caput and distal portion of femora, and patellae blackish, tibiae also darker distally.

Female. Similar to male in general appearance (Fig. 2A) but eye tubercle with only one or two teeth dorsally and tibiae and tarsi of palpi entirely lacking tubercles. Coxae of legs and genital plate only poorly granular. Labrum simple, wedge-shaped (Fig. 1G–H). Coloration is generally paler than in the male and a central figure of abdomen is well-developed (Fig. 2A).

Genitalia. Penis. Shaft 3.12 mm L, 0.49 W (base), 0.15 W (middle); glans 0.45 L; alate part 0.76 L. Shaft long, widened proximally, flattened dorsoventrally, in profile nearly straight (Fig. 1 I–J). Alate part well-developed: wing ratio (alate part L/shaft L×100) 24. A very thin membraneous fringe runs from the base of wing to a point near basal opening. Glans: upper side straight, underside slightly convex, with two pairs of short bristles near distal end (Fig. 1 K). Musculature limited to the proximal one third of shaft.

Ovipositor. Three+29 segments; seminal receptacles (Fig. 1 L) in second and third segments.

Remarks. The new form is clearly separated from the nominate one, *N. genufusca genufusca* (KARSCH) known from Japan by the armaments of palpal segments. Namely, in the latter the ventral side of patella and tibia is completely smooth, whereas in the former both the segments are armed ventrally with numerous tubercles, and the tarsus is more strongly tuberculated.

In 1950, SUZUKI shortly recorded the presence of *N. genufusca genufusca* in Korea.

The specimen was collected by me in Gumgang San, Korea in 1936. However, under present state of our knowledge, there is some doubt about its specific identification. Unfortunately, it cannot be reexamined because of the loss of that specimen. Afterward, STAREGA (1965) reported *N. genufusca genufusca* from north Korea. The specimen he studied was a single female, which according to his report differs from the previous descriptions (ROEWER, 1923, and others) in many characters. Judging from his description, the specimen seems to be very close to *N. coreana* described below. Future comparative study of penis will reveal their specific relations.

Nelima coreana n. sp.

(Figs. 2 B–C and 3)

Material. Holotype ♂: Korea: Chung-bug-do, Yeonpung, Suyeo Cave, 5. VIII. 1964 (J. NAM-GUNG). Paratypes: Korea: Chung-bug-do, Eumseong, Mt. Surii, 16. IX. 1965, 1♂, 1♀; Chung-bug-do, Eumseong, Sajeong-rii, 23. X. 1965, 1♀; Kyeong-ki-do, Anseong, Mt. Chilhyon, 8. X. 1965, 3♂, 1♀ (J. NAM-GUNG).

Measurements (in mm). ♂ (in parentheses ♀): As follows:

Loc.	Body L	Ceph. W	Abd. W	Fe I	Leg I
Suyeo C.	3.8	2.6	2.3	7.2	33.4
Mt. Surii	3.6 (5.5)	2.2 (2.7)	1.9 (3.0)	5.8 (6.9)	27.5 (31.6)
Sajeong-rii	(6.2)	(4.8)	(5.5)	(7.3)	(35.8)
Mt. Chilhyon	3.4, 3.8,	2.2, 2.1,	1.9	6.4, 5.8,	30.3, 30.2,
	4.1 (5.9)	2.7 (3.7)	(3.8)	7.1 (6.8)	34.2 (31.4)

Male. Body. Of the form as in Fig. 2B. Surface of dorsum uniformly and finely shagreened. Eye tubercle, from above as long as wide, in profile longer than high, rounded above, shallowly canaliculate, unarmed, rarely with one or two small spinules on the carinae. Surface of coxae I–IV and genital plate thickly granular, free sternites smooth, with only a row of fine hairs. Labrum small, from above thickened distally, bluntly pointed (Fig. 3 G–H).

Chelicerae. Of normal structure; segment I smooth above, II unarmed. Supracheliceral lamellae as in Fig. 3C.

Palpi. Of the form as in Fig. 3E. Trochanter, femur, patella and tibia nearly smooth except for but few small tubercles. Tarsus has a ventromedial row of dense dark-tipped tubercles almost on the entire length and an accessory row of sparse tubercles (Fig. 3F).

Legs. Slender and long. Trochanters rather strongly toothed laterally. Femora with numerous sharp-pointed teeth throughout, patellae and tibiae (only proximally) with sparse teeth.

Coloration. Dorsum dark to blackish brown. Anterior part of carapace silvery-white, with brown to dark brown markings on both sides, these markings are as shown in Fig. 2B. Eye tubercle rusty to dark brown, with black eye rings,

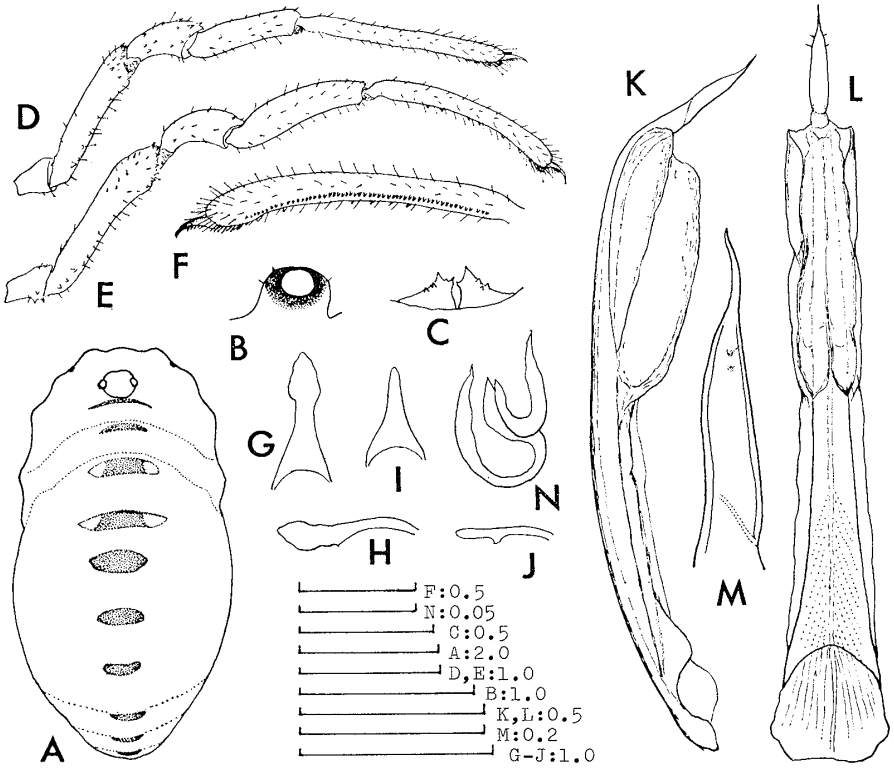

Fig. 3. *Nelima coreana* n. sp. —— A, Dorsal view of body, ♀; B, left side view of eye tubercle, ♂; C, supracheliceral lamellae, ♂; D–E, ectal view of right palp: D, ♀, E, ♂; F, mesal view of tarsus of right palp, ♂; G, I, dorsal, and H, J, lateral view of labrum: G–H, ♂, I–J, ♀; K, lateral, and L, ventral view of entire penis; M, lateral view of glans; N, seminal receptacle. Scale in mm.

lighter basally. Abdominal scutum and free tergites almost blackish. Venter whitish to greyish yellow; coxae darker distally, free sternites spotted with dark brown. Chelicerae and palpi whitish yellow, but femur, patella and tibia of palpi somewhat darker dorsally. Legs rusty to dark brown, femora lighter basally but caput and distal portion blackish, and so patellae.

Female. Body larger than the male (Fig. 2C). Sclerotized plates of abdominal segments I–VIII are free, thus forming the type of "scutum laminatum" (Fig. 3A). (Male of "scutum parvum"). Coxae I–IV almost unarmed except for distal region, where some scattered dark brown granules are present. Labrum small, simple, wedge-shaped (Fig. 3 I–J). Supracheliceral lamellae unarmed. Palpi as in Fig. 3D, tarsus lacking the definite rows of ventral tubercles. Ground color of body as in the male but markings more well-developed (Fig. 2C).

Genitalia. Penis. Shaft 1.48–1.83 mm L, 0.3–0.34 W (base), 0.12–0.13 W (middle); glans 0.2 L; alate part 0.7–0.74 L. Shaft relatively short, widened basally, in profile strongly curved ventrad (Fig. 3 K–L). Alate part very well developed, conspicuously long, extending to a point nearly midway of the shaft (wing ratio

40–47); from its base runs a distinct membraneous fringe, which reaches to a point just before the basal opening. Musculature in almost proximal half of shaft.

Ovipositor. Three+24 segments; seminal receptacles (Fig. 3 N) in third segment.

Remarks. The present species appears to be most close to *N. genufusca tuberculata* described above, immediately separated from it by the structure of the penis. Moreover, the smaller size of the male and the presence of scutum laminatum in the female serve to distinguish both the species.

Oligolophus tienmushanensis WANG

(Fig. 4)

Oligolophus tienmushanensis WANG, 1941: 106. —— STAREGA, 1965: 5. —— SUZUKI, 1977: 151.

Material. Korea: Cholla-pug-do, Mt. Jiri, 2♀, 13. VIII. 1963; Chung-bug-do, Mt. Socrii, 2 pulli, 16. V. 1965, 3 pulli, 19. VI. 1965, 1♀, 5. VIII. 1965; Chung-bug-do, Eumseong, Mt. Surii, 1♂, 19. XI. 1965 (J. NAM-GUNG); Geongsan-bug-do, Kyungsan-kun, Mt. Palgong, near Dongwhasa Temple, 2♂, 25. VIII. 1976 (T. IMAMURA); Jeju-do, Mt. Hanla, at 1200 m, 1♂, 22.X. 1973, at 1300 m, 4♂, 2♀, 6. X. 1974 (M. TASHIRO).

Measurements (in mm). ♂ (in parentheses ♀): As follows:

Loc.	Body L	Ceph. W	Abd. W	Fe I	Leg I
Mt. Palgong	4.6, 4.9	2.7, 2.8	3.4, 2.8	5.5, 4.7	25.1, 24.8
Mt. Surii	4.2	2.7	2.8	5.7	25.4
Mt. Socrii	(5.2)	(2.9)	(3.0)	(3.6)	(17.2)
Mt. Hanla	4.1, 4.6	2.6, 2.5	2.7, 2.8	3.9, 3.8	18.4, 18.7
	(6.1, 6.4)	(3.2, 2.7)	(3.6, 4.0)	(2.9, 3.1)	(13.3, 14.9)

Male. Body. Of the form as in Fig. 4A. Surface of dorsum very finely granular. Carapace with 3+2 spine-like teeth at median of frontal margin. On lateral borders and upper surface of carapace present small hair-tipped teeth, disposition of these teeth as in Fig. 4A. Two thoracic and 1–7 abdominal tergites with a transverse row of small pointed teeth. Eye tubercle, from above broader than long, canaliculated above, with a row of 4–5 tall hair-tipped teeth on both carinae. Coxae. I–IV unarmed, clothed thickly with black bristles, bristles usually arising on a low elevation, especially so on I and II. I and II with a long spine at dorsal apical and posterior distal position, III with a dorsal apical spine, IV prolaterally with a large blunt tubercle. Genital operculum as in Fig. 4E, free sternites each with short black hairs.

Chelicerae. Rather short and thick; segment I usually with a ventral spur, but in Mt. Surii individual it has no such a spur, only a light elevation present at base (Fig. 4 F–G); II only hairy, movable finger without a dorsal apophysis at base.

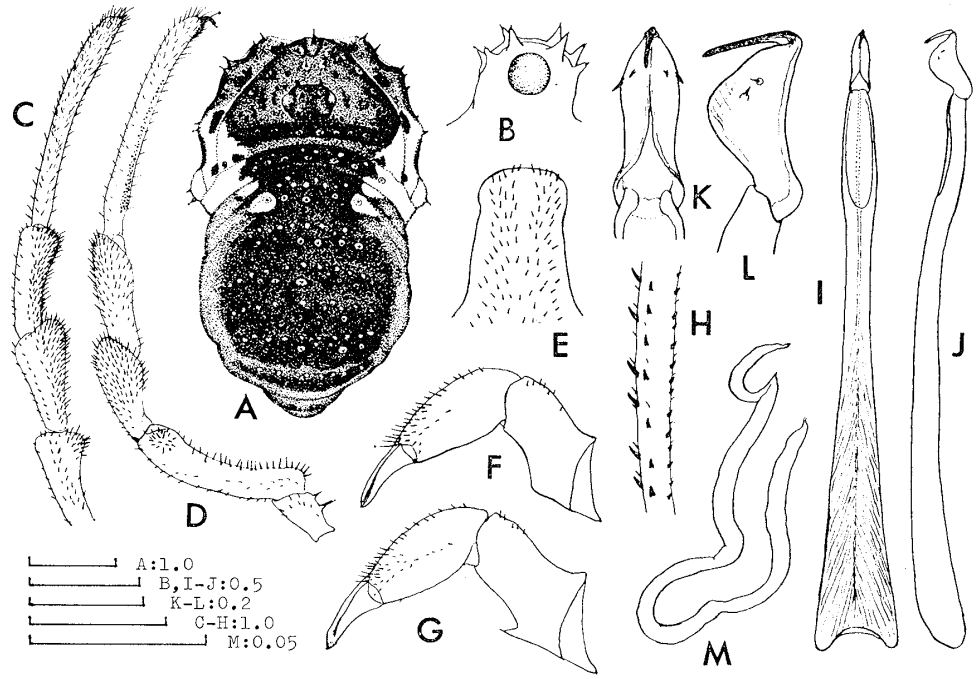

Fig. 4. *Oligolophus tienmushanensis* WANG. —— A, Dorsal view of body, ♂; B, left side view of eye tubercle, ♂; C, dorsal, and D, mesal view of palp, ♂; E, genital plate, ♂; F–G, ectal view of left chelicera, ♂: F, Mt. Surii ex., G, Mt. Palgong ex.; H, lateral view of left first femur, ♂; I, dorsal, and J, lateral view of penis; K, dorsal, and L, lateral view of glans; M, seminal receptacle. Scale in mm.

Supracheliceral lamellae very low, unarmed.

Palpi. As in Fig. 4 C–D. Femur usually unarmed, but in one specimen some black denticles present at base. This is considered individual variation. Tarsus armed ventromedially with numerous black tubercles.

Legs. Slender and long. Trochanters with 1–2 spine-like teeth on both lateral sides. Femora toothed as shown in Fig. 4H, in addition, femora and patellae with 2–3 sharp spines dorsally at apical margin.

Coloration. Ground color of body yellowish to milky white. A dark brown to blackish median figure runs between the front margin of carapace and fifth or sixth abdominal tergite (Fig. 4A). Eye tubercle dark brown, yellowish brown around eyes. Chelicerae and palpi yellowish white; cheliceral segment I dorsally and II laterally spotted with brown; femur, patella and tibia dorsally with brownish flecks. Legs dark to blackish brown, tarsus slightly lighter.

Genitalia. Penis (Fig. 4 I–L). Shaft 2.4–2.8 mm L, 0.31–0.38 W (base), 0.13 W (middle); glans 0.3–0.33 L. Shaft of moderate length, widest at base, continuously narrower distally, at the level of dorsal furrow slightly widened again; dorsal furrow begins just below the glans-articulation, almost reaching to the full width of shaft. Upper side of glans somewhat concave, underside strongly convex, underside with a deep channel on the entire length. Musculature in the proximal

half of shaft.

Ovipositor. Three+23 segments; seminal receptacles (Fig. 4M) in first segment.

Distribution. South China (Chekiang: type locality), Taiwan (Alishan), Korea including Jeju-do.

Relationships. This species strikingly resembles *O. aspersus* (KARSCH) known from the Japanese Islands. In order to help the classification of both the species the following table is given.

Species		*tienmushanensis*	*aspersus*
Armaments on median frontal area of carapace		3+2 teeth	3 teeth
Armaments of eye tubercle		4–5 pairs of tall spine-like teeth	4–5 pairs of low teeth
Chelicera	segment I	unarmed laterally	lateral row of teeth present
	movable finger	no remarkable armament	with dorsal apophysis at base
Penis shaft		considerably widened at base	not so widened at base

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